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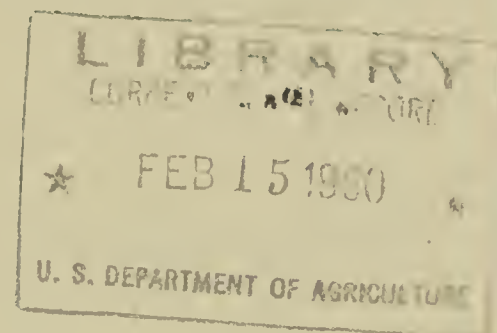
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TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 577

Moisture Storage By Leaf Litter^{1/}



In the 1930's the Lake States Forest Experiment Station operated a series of lysimeters at La Crosse, Wis. In connection with this, the researchers wanted to know how much rainfall was caught and held by the litter layer that had been placed on the lysimeters as part of their treatment. This Note reports their findings.^{2/}

Six boxes, 1 square foot in area, were constructed, with bottoms of screen wire. Square-foot samples of litter were taken from the lysimeters and placed in the boxes. Three samples were hardwood litter and three were Scotch pine. Their weights, representing 2 to 3 inches in litter depth, were as follows:

Hardwood litter (Pounds)	Pine litter (Pounds)
1.58	0.95
1.62	0.96
1.52	1.00

Galvanized tanks were placed under the boxes to catch the rain that filtered through the litter. This was measured after each storm for three growing seasons, during which 136 storms occurred. Precipitation was measured with a recording rain gage. Moisture retained by the litter was computed as the difference between the amount of precipitation and the volume of water in the tanks. Average values for each set of three boxes were used in computing the amounts held by the two litter types.

Since the test boxes were located in the open and received full effects of radiation, wind, and other factors which influence wetting and drying of leaves, the data only approximate the amounts of rain that might be stored in the litter under a natural forest canopy.

^{1/} This study is one phase of the watershed management research being conducted in cooperation with the Wisconsin Conservation Department.

^{2/} The data were collected by Robert G. Neu, now with the Agricultural Research Service, U. S. Department of Agriculture, at Madison, Wis.

The amount of moisture held by both the hardwood litter and the pine litter was nearly the same--34.2 percent and 33.2 percent respectively of the total precipitation for the 3 years (table 1). The amount retained varied by size of storm. From rains of less than 0.25 inch, 93.7 percent of the total amount was retained by each litter type; for rainfalls over 1.00 inch only about 11 percent was held in the litter. What does this mean in terms of inches of water? For hardwood litter the average was 8.7 inches, for Scotch pine litter, 8.4 inches. Since the hardwood litter weighed about one-third more than the pine litter, one might infer that pine litter of equal weight would intercept more moisture.

From the lysimeter study, researchers have learned that litter plays a complex role. Its influence in maintaining high infiltration and reducing surface runoff and erosion is now established. This study shows that the ability of litter to store moisture may also be an important hydrologic function.

Table 1.--Summary of precipitation stored by leaf litter

Precipitation class	: Number : of storms	: Total : precipi- : tation	Moisture stored in--			
			Hardwood litter	:	Scotch pine litter	
		Inches	Inches	Percent	Inches	Percent
0-0.25 inch	56	5.71	5.35	93.7	5.39	93.7
0.26-0.50 "	26	9.51	6.31	66.4	6.12	64.4
0.51-1.00 "	35	25.03	10.38	41.5	9.87	39.4
Over 1.00 "	19	35.71	3.96	11.1	3.86	10.8
Total or average	136	75.96	26.00	34.2	25.24	33.2

WILLIE R. CURTIS, Research Forester
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January 1960